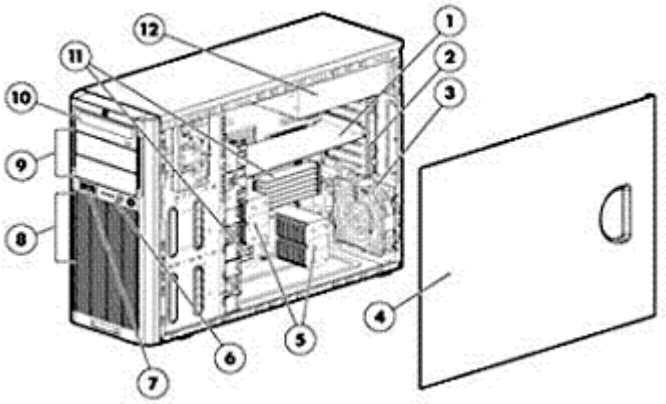
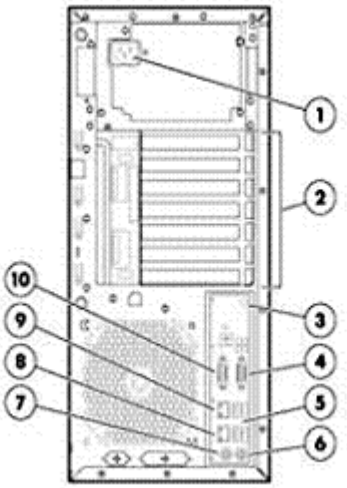
Overview

The HP ProLiant ML150 G6 is an expandable and affordable solution for growing businesses. Redundant power supply and redundant fan options help to provide more protection on power and thermal to keep your critical business running. Data security, which is one of the major concerns in the industry, is ensured by the TPM offering that provides data encryption to protect from data theft. Companies with remote locations can take advantage of the ML150 G6 embedded Lights-Out 100 remote management feature to decrease server/company downtime, decrease emergency travel needs, and increase overall productivity. Overall, the HP ProLiant ML150 G6 is easy on your IT budget with significant headroom to grow with your business.





Front View:

1. SATA/SAS adapter card
2. Card bracket retainer
3. Rear fan
4. Side access panel
5. Processor socket and Heatsink
6. LED indicators and power button
7. Upfront USB ports
8. Hard drive bays (inside)
9. One full height or two half height media bay (s)
10. Optical drive media bay
11. DIMM socket (total twelve DIMMs supported)
12. Power Supply

Rear View:

1. AC input connector
2. Expansion slots
3. UID LED
4. VGA monitor connector
5. USB 2.0 ports (4)
6. Keyboard connector
7. Mouse connector
8. NIC port
9. Dedicate NIC port
10. Serial port connector

What's New

- Support for R5000 and R7000 Uninterruptible Power System.

Standard Features

NOTE: For the Standard Features shipped in the "Factory Integrated Models", please see the "Configuration Information - Factory Integrated Models" section.

Processor One of the following depending on Model	Quad-Core Processors Intel® Xeon® E5540 (2.53GHz/4-core/8MB/80W, DDR3-1066, HT, Turbo 1/1/2/2) Processor NOTE: Available through Configure To Order only. See Factory Integration Models section for more details Intel® Xeon® E5530 (2.40GHz/4-core/8MB/80W, DDR3-1066, HT, Turbo 1/1/2/2) Processor NOTE: Available through Configure To Order only. See Factory Integration Models section for more details Intel® Xeon® E5520 (2.26GHz/4-core/8MB/80W, DDR3-1066, HT, Turbo 1/1/2/2) Processor Intel® Xeon® E5506 (2.13GHz/4-core/4MB/80W, DDR3-800) Processor NOTE: Available through Configure To Order only. See Factory Integration Models section for more details Intel® Xeon® E5504 (2.00GHz/4-core/4MB/80W, DDR3-800) Processor Dual-Core Processors Intel® Xeon® E5502 (1.86GHz/2-core/4MB/80W, DDR3-800) Processor NOTE: HT indicates that the processor model supports Intel® Hyper-Threading Technology. NOTE: Turbo indicates the maximum potential frequency increment when using Intel® Turbo Boost Technology, with 4, 3, 2, and 1 cores active. NOTE: DDR3 speed is the maximum memory speed of the processor. Actual memory speed may depend on the quantity and type of DIMMs installed. NOTE: For the Intel 5500 Series, the letter preceding the model number indicates the performance/wattage of the processor. "X" denotes High Performance/Wattage; "E" denotes Enterprise Performance/Wattage (Mainstream); and "L" denotes Lower Wattage.
Cache Memory One of the following depending on Model	Integrated 1 x 8MB level 3 cache (E5540, E5530, E5520 sequence) Integrated 1 x 4MB level 3 cache (E5506, E5504, E5502 sequence)
Chipset	Intel® 5500 Chipset NOTE: For more information regarding Intel chipsets, please see the following URL: http://www.intel.com/products/server/chipsets/
Upgradeability	Upgradeable to two processors (dual or quad-core) NOTE: Please contact your regional sales support.

Standard Features

Memory	Type	DDR3 Registered (RDIMM) or Unbuffered (UDIMM)
	DIMM Slots	Total 12 DIMM slots
	Standard (Entry/Base Models)	2 GB
	Standard (Performance Models)	4 GB
	Maximum (RDIMM)	48 GB (12 x 4 GB) for Registered Memory configurations
	Maximum (UDIMM)	48 GB (12 x 4 GB) for Unbuffered Memory configurations
	NOTE: Depending on the memory configuration and processor model the memory speed may run at 1066MHz or 800MHz. See the Online Memory Configuration Tool for details: http://www.hp.com/go/ddr3memory-configurator.	

Network Controller	Embedded HP NC107i PCI Express Gigabit Server Adapter

Expansion Slots #	Technology	Bus Width**	Connector Width	Bus Number*	Form Factor	Notes
1	32-bit/33MHz PCI	N/A	N/A	1	Full length, full height slot	Non Hot-plug
2	PCI-Express (Gen 1)	x4	x8	2	Full length, full height slot	Non Hot-plug
3	PCI-Express (Gen 2)	x4	x8	7	Full length, full height slot	Non Hot-plug
4	PCI-Express (Gen 2)	x16	x16	5	Full length, full height slot	Non Hot-plug
5	PC-Express (Gen 2)	x4	x8	6	Full length, full height slot	Non Hot-plug

* Default bus assignment (in decimal). Inserting cards with PCI bridges may alter the actual bus assignment number.
** Indicates the number of physical electrical lanes running to a PCI-e connector.

Storage Controller	Entry Model	HP Smart Array B110i SATA RAID Controller (RAID 0,1,10) NOTE: To enable RAID for HP Smart Array B110i SATA controller, use EZ set-up CD to download driver, hpahcisr.sys, part of EZ Set-up CD For more information go to: www.hp.com/go/sataraid. NOTE: SA B110i SATA RAID Controller ships standard with every server. NOTE: HP Smart Array B110i does not support greater than 2TB hard drive.
	Base Model	HP Smart Array P410/Zero Memory RAID Controller (RAID 0,1std)
	Performance Model	HP Smart Array P410/256MB RAID Controller (RAID 0/1/1+0/5/5+0)

Standard Features

Internal Storage Devices One of the following depending on Model	Diskette Drive	None ships standard
	Optical Drive	HP Half-Height SATA DVD-ROM Optical Drive ships standard
	Hard Drive	Performance and Base Models (Hot Plug): None ships standard Entry Model (Non-Hot Plug): 1x160GB NHP SATA Drive NOTE: Support for additional 4 LFF SAS/SATA hot plug drive requires 2nd hot-plug hard disk drive cage, 750W CS HE Power Supply, Redundant Power Supply Enablement Kit and HP Smart Array P410 Controller (if not already part of the configuration).
Maximum Internal Storage One of the following depending on Model	SATA	24.0TB (8 x 3TB 3.5") SATA
	SAS	24.0TB (8 x 3TB 3.5") SAS
	NOTE: HP Smart Array B110i SATA RAID controller support for a single logical drive is limited to 2TB. NOTE: Support for more than 4 hard drives requires the purchase of one (1) Hot-plug hard drive cage (P/N: 487737-B21), one (1) HP 750W Common Slot Gold Hot Plug Power Supply Kit (P/N: 512327-B21), one (1) Redundant Power Supply Enablement Kit (P/N: 508544-B21) and HP Smart Array P410 Controller (if not already part of the configuration). NOTE: Supports up to eight (8) SAS/SATA hard drives via 2nd hot plug hard disk drive cage, 750W CS HE Power Supply, Redundant Power Supply Enablement Kit and HP Smart Array P410 Controller. NOTE: HP NHP Internal SAS/SATA 4 Port Cable Kit (487734-B21) is required when adding Smart Array P410 Controller on Non-Hot Plug SATA/SAS server models.	
Interfaces	Parallel	0
	Serial	1
	Pointing Device (Mouse, PS2)	1
	Graphics	1
	Keyboard (PS2)	1
	USB 2.0 Ports	8 total (4 Rear, 2 Front, and 2 Internal)
	NOTE: 1 Dedicated USB port available for internal USB tape connectivity NOTE: Please see the following URL for additional information regarding USB support http://h18004.www1.hp.com/products/servers/platforms/usb-support.html	
	Network RJ-45 (Ethernet)	1 (10/100/1000 bits/s)
	Remote Management	HP Lights-Out 100i Baseboard Management Controller
Industry Standard Compliance	ACPI V2.0 compliant PCI 2.3 compliant IPMI 2.0 DCMI 1.0 PXE Support WOL Support Microsoft® Logo certifications	

Standard Features

Server Power Cord	One Lowline NEMA power cord
Power Supply	Standard: HP 460W Factory Integrated Power Supply Optional: HP 750W Common Slot Gold Hot Plug Power Supply NOTE: The installation of the optional 750W Redundant Power Supply requires a HP Redundant Power Supply Enablement Kit (P/N 508544-B21). NOTE: Two (2) 750W Redundant Power Supply units and one (1) RPS enablement kit (P/N 508544-B21) are required to achieve redundancy. NOTE: The 2nd hot plug hard disk drive cage requires the purchase of 750W Redundant Power Supply, Redundant Power Supply Enablement Kit and HP Smart Array P410 Controller (if not already part of the configuration)
System Fans	System supports a total of four (4) fans Two (2) fans ship standard for 1P configuration - Non-hot plug, Non-redundant system fans NOTE: For redundancy, please order a redundant fan option kit (513927-B21) which comes with 2 fans Three(3) fans ship standard for 2P configuration - Non-hot plug, Non-redundant system fans NOTE: If customer orders the standalone redundant fan option kit (513927-B21), two (2) fans in a two-fan packaged box will be received. Only one (1) fan is required for system redundancy. The other one can be saved as a spare part. NOTE: If customer orders the redundant fan kit along with the server, the extra fan will not be received.
Operating Systems and Virtualization Software Support for ProLiant Servers	Microsoft Windows Server Hyper V Red Hat Enterprise Linux (RHEL) SUSE Linux Enterprise Server (SLES) NOTE: For more information on HP's Certified and Supported ProLiant Servers for OS and Virtualization Software and latest listing of software drivers available for your server, please visit our Support Matrix at: http://www.hp.com/go/ossupport and our driver download page http://www.hp.com/support/ML150G6
Graphics	32MB shared supporting all display resolutions up to 1600x1200 16bpp @75Hz NOTE: 8MB is dedicated to video memory.
Form Factor	Tower (5U) NOTE: Rack mounting available via HP Tower to Rack Conversion Tray, Universal Kit. Please see the options section in this QuickSpecs.

Standard Features

Embedded Manageability	HP LO100i Advanced	HP LO100i Lights-Out 100 Baseboard Management Controller with Optional LO100i Advanced Licenses for Virtual KVM and Virtual Media. Features: • Embedded IPMI standard reporting • System event log access • Remote Serial console (serial redirection) • Browser, Telnet access • SMASH-CLP compliant • IPMI 2.0 compliant • DCMI 1.0 • Secure Socket Layer Encryption • Secure Shell Encryption • Virtual media (Floppy, CD, USB 2.0) with Advanced License • Virtual KVM with Advanced License NOTE: For more information, please refer to the QuickSpecs for the LO100i found at: www.hp.com/go/lo100

Manageability	HP Integrated Lights-Out 100i Baseboard Management Controller with optional LO100i Advanced Licenses for Virtual KVM and Virtual Media. Embedded IPMI standard reporting Easy Set-up CD and ISO Image Web downloads Array Configuration Utility (ACU) Array Diagnostics Utility (ADU) HP Insight Diagnostics HP Insight Management Agents and Insight Management Providers for Systems Insight Manager (SIM) Integration
Security	Power-on password Setup password Diskette boot control Secure Sockets Layer (SSL) Secure Shell (SSH)
Warranty	This product is covered by a global limited warranty and supported by HP Services and a worldwide network of HP Authorized Channel Partners. Hardware diagnostic support and repair is available for one year from date of purchase. Support for software and initial setup is available for 90 days from date of purchase. Enhancements to warranty services are available through HP Care Pack services or customized service agreements. Hard drives have either a one year or three year warranty; refer to the specific hard drive QuickSpecs for details. NOTE: Server Warranty includes 1 year Parts, 1 year Labor, 1-year on-site support with next business day response. (3-1-1 warranty offered only in Brazil and APeJ). Warranty repairs may be accomplished through the use of Customer Self Repair (CSR) parts. These parts fall into two categories: 1) Mandatory CSR parts are designed for easy replacement. A travel and labor charge will result when customers decline to replace a Mandatory CSR part; 2) Optional CSR parts are also designed for easy replacement but may involve added complexity. Customers may choose to have HP replace Optional CSR parts at no charge. Additional information regarding worldwide limited warranty and technical support is available at: http://h18004.www1.hp.com/products/servers/platforms/warranty/index.html

Optional Features

Factory Express Portfolio for Servers and Storage

HP Factory Express offers configuration, customization, integration and deployment services for HP servers and storage products. Customers can choose how their factory solutions are built, tested, integrated, shipped and deployed.

Factory Express offers service packages for simple configuration, racking, installation, complex configuration and design services as well as individual factory services, such as image loading, asset tagging and custom packaging to meet customer needs. HP products supported through Factory Express include a wide array of servers and storage: HP Integrity, HP ProLiant & HP ProLiant Server Blades, HP BladeSystem, HP 9000 servers as well as the MSAxxxx, VA7xxx, EVA, XP, rackable tape libraries and configurable network switches.

For more information on Factory Express services on your specific server model please contact your sales representative or go to: http://www.hp.com/go/factory-express.

HP Enterprise Configurator

The HP eConfigure Enterprise Configurator now provides factory default racking for our HP hardware portfolio. This approach is aligned with our strategic direction to meet the needs and expectations of our valued customers. If you require "custom" rack configuration, please contact HP's Customer Business Center or an Authorized Partner for assistance. http://www.hp.com/products/configurator.

Service and Support

HP Technology Services for Industry Standard Servers and BladeSystem
Capitalizing on HP ProLiant server and HP BladeSystem capabilities requires a service partner who understands your increasingly complex business technology environment. That's why it makes sense to team up with the people who know HP infrastructure hardware and software best - the experienced professionals at HP Services.

What HP ProLiant and BladeSystem Services can do for you
HP ProLiant and BladeSystem Services can help you design, deploy, test, integrate, support, and manage IT and infrastructure solutions. This way, HP proposes services solutions that include more than just uplift of base warranty. You can get the support you need by choosing from one of a number of service packaged solutions we have designed to address wider set of customer support needs.

HP Technology Services meets business challenges with services offered in three packages:
Optimized Care Package, Standard Care Package, and Basic Care Package
Available for each product group. Such packaged solutions enable customers to optimize technology operations, minimize risk and drive better business outcomes with easy-to-buy, easy-to-use scalable support packages for servers, storage, networking and software.

Optimized Care Package

Supports maintaining servers at optimum performance availability

HP ProLiant Server Hardware Installation
Provides for the basic hardware installation of HP branded servers, storage devices and networking options to assist you in bringing your new hardware into operation in a timely and professional manner.
http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-9356EN.pdf

3-Year HP 6 hour Hardware Support Onsite Call-to-Repair Service
Provides an IT manager with a team of support specialists who will quickly begin troubleshooting the system to help return the hardware to operating condition within 6 hours of the initial service request to the HP Global Solution Center.
http://h20195.www2.hp.com/V2/GetPDF.aspx/5982-6547EN.pdf

Additional Services: Software OS (Microsoft, Linux (SUSE/Red Hat) Installation and Start Up and Software Support) plus Microsoft or Linux education courses +30 Proactive Select Credits, Factory Express.

Service and Support

Standard Care Package	Package that maintains high level of server availability HP ProLiant Server Hardware Installation Provides for the basic hardware installation of HP branded servers, storage devices and networking options to assist you in bringing your new hardware into operation in a timely and professional manner. http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-9356EN.pdf 3-Year HP 24x7 4 hour Response, Hardware Support Onsite Service Provides you with rapid remote support and if required an HP authorized representative who will arrive on site any time and day of the year to begin hardware maintenance service within 4 hours of the service request being logged. http://h20195.www2.hp.com/V2/GetPDF.aspx/5982-6547EEE.pdf Additional Services: Software OS (Microsoft, Linux (SUSE/Red Hat) Installation and Start Up and Software Support); +10 Proactive Select Credits, Factory Express.
Basic Care Package	Delivers minimum recommended support service level HP ProLiant Server Hardware Installation Provides for the basic hardware installation of HP branded servers, storage devices and networking options to assist you in bringing your new hardware into operation in a timely and professional manner. http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-9356EN.pdf 3-Year HP 13x5 4 hour Response, Hardware Support Onsite Service Delivers increased equipment availability and productivity with rapid remote support and onsite response for your HP server and storage hardware. http://h20195.www2.hp.com/V2/GetPDF.aspx/5982-6547EEE.pdf Additional Services: Software OS (Microsoft, Linux (SUSE/Red Hat) Installation and Start Up and Software Support), Factory Express.
Insight Remote Support	The packages include HP Insight Remote Support that uses proven technology to deliver secure, reliable 24x7 remote monitoring, diagnoses, and problem resolution. It is available at no additional cost to all warranty, HP Care Pack Service, and service agreement customers.
For more information	To learn more on HP ProLiant servers and HP BladeSystem servers, please contact your HP sales representative or HP Authorized Channel Partner or visit: http://www.hp.com/services/proliant

SAS/SATA Hot Plug Models

NOTE: For the Standard Features shipped in the "Factory Integrated Models", please see the "Configuration Information - Factory Integrated Models" section.
NOTE: Pre-configured models ship with the configurations below. Options can be selected from the Core or Additional options section of this QuickSpecs.
NOTE: HP does not allow factory integration of options into pre-configured models. Any additional options purchased will be shipped separately.
NOTE: If you desire a custom configuration please see "Configuration Information - Factory Integrated Models" section of this QuickSpecs.
NOTE: The following Performance and Base hot -plug models can support up to 4 hard drives only. Support for more than 4 hard drives (maximum 8 hard drive support on this server) require the purchase of one (1) Hot-plug hard drive cage (P/N: 487737-B21), one (1) HP 750W Common Slot Gold Hot Plug Power Supply Kit (P/N: 512327-B21), and one (1) Redundant Power Supply Enablement Kit (P/N: 508544-B21).

Performance Model

HP ProLiant ML150 G6 E5520 1P 4GB-U P410/256 SAS/SATA 460W PS Server
466133-001

Processor	(1) Intel® Xeon® E5520 (2.26GHz/4-core/8MB/80W, DDR3-1066, HT, Turbo 1/1/2/2) Processor
Cache Memory	Integrated 1x 8 MB L3 cache
Memory	4 GB (2 x 2 GB) PC3-10600E Unbuffered Advanced ECC memory NOTE: Total 12 DIMM slots
Network Controller	Embedded HP NC107i PCI Express Gigabit Server Adapter
Storage Controller	HP Smart Array P410 controller w/256MB cache Raid Controller (RAID 0/1/1+0/5/5+0)
Hard Drive	None ships standard
Internal Storage	SAS: 8.0TB (4 x 2TB 3.5") Maximum SATA: 8.0TB (4 x 2TB 3.5") Maximum
Optical Drive	HP Half-Height SATA DVD-ROM Optical Drive
Power Supply	460W Non-Hot Plug, Non-Redundant Power Supply
Fans	Two (2) - Non-hot plug, Non-redundant system fans
Keyboard/Mouse	Ship standard
Form Factor	5U Tower
Warranty	Server Warranty includes 1 year Parts, 1 year Labor, 1-year on-site support with next business day response. (3-1-1 warranty offered only in Brazil and APeJ)

Base Model

HP ProLiant ML150 G6 E5504 1P 2GB-U P410/ZM Hot Plug SAS/SATA 460W PS Server
466132-001

Processor	(1) Intel® Xeon® E5504 (2.00GHz/4-core/4MB/80W, DDR3-800) Processor
Cache Memory	Integrated 1 x 4 MB L3 cache
Memory	2 GB (1 x 2GB) PC3-10600E Unbuffered Advanced ECC memory NOTE: Total 12 DIMM slots
Network Controller	Embedded HP NC107i PCI Express Gigabit Server Adapter
Storage Controller	HP Smart Array P410 controller w/ Zero Memory cache Raid Controller (RAID 0,1, 0+1)
Hard Drive	None ships standard

Pre-configured Models

Internal Storage	SAS: 8.0TB (4 x 2TB 3.5") Maximum SATA: 8.0TB (4 x 2TB 3.5") Maximum
Optical Drive	HP Half-Height SATA DVD-ROM Optical Drive
Power Supply	460W Non-Hot Plug, Non-Redundant Power Supply
Fans	Two (2) - Non-hot plug, Non-redundant system fans
Keyboard/Mouse	Ship standard
Form Factor	5U Tower
Warranty	Server Warranty includes 1 year Parts, 1 year Labor, 1-year on-site support with next business day response. (3-1-1 warranty offered only in Brazil and APeJ)

SATA Non-Hot Plug Models

NOTE: For the Standard Features shipped in the "Factory Integrated Models", please see the "Configuration Information - Factory Integrated Models" section.

NOTE: Pre-configured models ship with the configurations below. Options can be selected from the Core or Additional options section of this QuickSpecs.

NOTE: HP does not allow factory integration of options into pre-configured models. Any additional options purchased will be shipped separately.

NOTE: If you desire a custom configuration please see "Configuration Information - Factory Integrated Models" section of this QuickSpecs.

NOTE: The following Entry non-hot plug model can support up to 4 hard drives only. Support for more than 4 hard drives (maximum 8 hard drive support on this server) require the purchase of one (1) Hot-plug hard drive cage (P/N: 487737-B21), one (1) HP 750W Common Slot Gold Hot Plug Power Supply Kit (P/N: 512327-B21), one (1) Redundant Power Supply Enablement Kit (P/N: 508544-B21) and HP Smart Array P410 Controller with HP NHP Internal SAS/SATA 4 Port Cable Kit (487734-B21).

NOTE: A hot-plug hard drive cage can be installed into a non-hot plug server by ordering one (1) hot-plug hard disk drive cage option kit (P/N 487737-B21) and a Smart Array P410 controller with HP NHP Internal SAS/SATA 4 Port Cable Kit (P/N 487734-B21).

Entry Model

HP ProLiant ML150 G6 E5502 1P 2GB-U B110i Non-hot Plug SATA 160GB 460W PS Server
466131-001

Processor(s)	(1) Intel® Xeon® E5502 (1.86GHz/2-core/4MB/80W, DDR3-800) Processor
Cache Memory	Integrated 1 x 4 MB L3 cache
Memory	2 GB (1 x 2GB) PC3-10600E Unbuffered Advanced ECC memory NOTE: Total 12 DIMM slots
Network Controller	Embedded HP NC107i PCI Express Gigabit Server Adapter
Storage Controller	HP Smart Array B110i SATA RAID Controller (RAID 0,1,10)
Hard Drive	One 160GB Non-Hot Plug SATA HDD
Internal Storage	SATA: 8.0TB (4 x 2TB 3.5") Maximum
Optical Drive	HP Half-Height SATA DVD-ROM Optical Drive
Power Supply	460W Non-Hot Plug, Non-Redundant Power Supply
Fans	Two (2) - Non-hot plug, Non-redundant system fans
Keyboard/Mouse	Ship standard
Form Factor	5U Tower
Warranty	Server Warranty includes 1 year Parts, 1 year Labor, 1-year on-site support with next business day response. (3-1-1 warranty offered only in Brazil and APeJ)

Smart Buys

The ProLiant Smart Buy program offers a collection of promotional server and option products that are configured with SMB in mind, offered at discounted prices, and positioned for quick delivery. Smart Buy server offers are available for a limited time only.

HP S-Buy ML150G6 E5504 250GB 2G 518174-005	Processor(s)	(1) Intel® Xeon® Processor E5504 (2.00 GHz, 80W, DDR3-800)
	Cache Memory	4MB Level 3 Cache
	Memory	HP 2GB UDIMM (1x2GB) 2Rx8 PC3-10600E-9 Kit
	Network Controller	Embedded HP NC107i PCI Express Gigabit Server Adapter
	Storage Controller	HP Smart Array B110i SATA RAID Controller (RAID 0,1,10)
	Hard Drive	One (1) HP 250GB SATA 7.2K NHP 3.5" MDL HDD
	Internal Storage	SATA: 4.0TB (4 x 1 TB) Maximum
	Power Supply	460W Non-Hot Plug Power Supply
	Optical Drive	HP Half-Height SATA DVD-ROM Drive
	Form Factor	Tower (5U)
HP S-Buy ML150G6 E5506 250GB 2G 518175-005	Processor(s)	(1) Intel® Xeon® Processor E5506 (2.13 GHz, 80W, DDR3-800)
	Cache Memory	4MB Level 3 Cache
	Memory	HP 2GB UDIMM (1x2GB) 2Rx8 PC3-10600E-9 Kit
	Network Controller	Embedded HP NC107i PCI Express Gigabit Server Adapter
	Storage Controller	HP Smart Array B110i SATA RAID Controller (RAID 0,1,10)
	Hard Drive	HP 250GB SATA 7.2K NHP 3.5" MDL HDD
	Internal Storage	SATA: 4.0TB (4 x 1 TB) Maximum
	Power Supply	460W Non-Hot Plug Power Supply
	Optical Drive	HP Half-Height SATA DVD-ROM Drive
	Form Factor	Tower (5U)
HP S-Buy ML150G6 E5506 2x250GB 4G 518176-005	Processor(s)	(1) Intel® Xeon® Processor E5506 (2.13 GHz, 80W, DDR3-800)
	Cache Memory	4MB Level 3 Cache
	Memory	4GB UDIMM (2x2GB) (2x HP 2GB 2Rx8) PC3-10600E-9 Kit
	Network Controller	Embedded HP NC107i PCI Express Gigabit Server Adapter
	Storage Controller	HP Smart Array B110i SATA RAID Controller (RAID 0,1,10)
	Hard Drive	(2) HP 250GB 3G SATA 7.2K NHP 3.5" MDL HDD, supports up to 4LFF HDD
	Internal Storage	SATA: 4.0TB (4 x 1 TB) Maximum
	Power Supply	460W Non-Hot Plug Power Supply
	Optical Drive	HP Half-Height SATA DVD-ROM Drive
	Form Factor	Tower (5U)
	Operating System	Microsoft Small Business Server 2008

Smart Buys

HP S-Buy ML150G6 E5520 8GB SBS 2011 659586-S01	Processor(s)	(1) Intel® Xeon® E5520 (2.26GHz/4-core/8MB/80W, DDR3-1066, HT, Turbo 1/1/2/2) Processor
	Cache Memory	Integrated 1x 8 MB L3 cache
	Memory	8GB RDIMM (2x4GB) 2Rx4 PC3-10600R-9
	Network Controller	Embedded HP NC107i PCI Express Gigabit Server Adapter
	Storage Controller	HP Smart Array P410 controller w/ Zero Memory cache Raid Controller (RAID 0,1, 0+1)
	Hard Drive	None ships standard
	Internal Storage	SATA: 4.0TB (4 x 1 TB) Maximum
	Power Supply	460W Non-Hot Plug Power Supply
	Optical Drive	HP Half-Height SATA DVD-RW Drive
	Form Factor	Tower (5U)
	Operating System	Windows Small Business Server 2011

NOTE: This section lists some of the steps required to configure a Factory Integrated Model. To ensure only valid configurations are ordered, HP recommends the use of an HP approved configurator. Contact your local sales representative for information on CTO product offerings and requirements.
NOTE: HP does not allow factory integration of options into standard models listed above.
Configure-to-order servers must start with a CTO Chassis.

Step 1: Base Configuration

HP Models	HP ProLiant ML150 G6 Configure-to-order Tower Server	487912-B21
	Factory Integrated Models ship with:	
	Embedded NC107i	
	Embedded B110i SATA RAID Controller (RAID 0/1/10)	
	PCA	
	Easy Set up CD	
	Keyboard and Mouse (selection required)	
	Power Cord	
	Tower 5U Form Factor	

Step 2: Choose Required Options (Select only one option from each category unless otherwise noted)

HP Processors	**Quad-Core Processor**	
	HP ML150 G6 Intel® Xeon® E5540 (2.53GHz/4-core/8MB/80W) FIO Processor Kit	507849-L21
	HP ML150 G6 Intel® Xeon® E5530 (2.40GHz/4-core/8MB/80W) FIO Processor Kit	507848-L21
	HP ML150 G6 Intel® Xeon® E5520 (2.26GHz/4-core/8MB/80W) FIO Processor Kit	507722-L21
	HP ML150 G6 Intel® Xeon® E5506 (2.13GHz/4-core/4MB/80W) FIO Processor Kit	507847-L21
	HP ML150 G6 Intel® Xeon® E5504 (2.00GHz/4-core/4MB/80W) FIO Processor Kit	507721-L21
	Dual-Core Processor	
	HP ML150 G6 Intel® Xeon® E5502 (1.86GHz/2-core/4MB/80W) FIO Processor Kit	507720-L21

HP Memory	**Registered DIMMs (RDIMMs)**	
	HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500656-B21
	HP 4GB (1x4GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500658-B21
	HP 4GB (1x4GB) Quad Rank x8 PC3-8500 (DDR3-1066) Registered CAS-7 Low Power Memory Kit	500660-B21
	Unbuffered DIMMs (UDIMMs)	
	HP 1GB (1x1GB) Single Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	500668-B21
	HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	500670-B21
	HP 4GB (1x4GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	500672-B21

NOTE: All DDR3 memory option kits consist of one DIMM per kit. For detailed memory configuration rules and guidelines, please use the Online DDR3 Memory Configuration Tool: www.hp.com/go/ddr3memory-configurator.
NOTE: Kits described as LP include Low Power DIMMs. For more information on ProLiant Energy Efficient Features, see: www.hp.com/go/proliant-energy-efficient

HP Optical Drives	HP Half-Height SATA DVD-ROM Optical Drive	447326-B21
	HP Half-Height SATA DVD-RW Optical Drive	447328-B21
HP Drive Cage Options	Non-hot Plug HDD Model	
	HP SATA 5U G6 Module FIO Kit	500448-B21
	NOTE: If non-hot plug drive cage is selected, then at least one non-hot plug SATA or SAS hard drive must be selected.	
	NOTE: Non-hot plug drive cage only supports non-hot plug drives.	
	Hot Plug HDD Model	
	HP 5U Large Form Factor (LFF) Hot Plug Drive Cage Kit	487737-B21
	NOTE: Hot-plug drive cage only supports hot-plug drives.	
	NOTE: Support for more than 4 hard drives requires the purchase of one (1) Hot-plug hard drive cage (P/N: 487737-B21), one (1) HP 750W Common Slot Gold Hot Plug Power Supply Kit (P/N: 512327-B21), one (1) Redundant Power Supply Enablement Kit (P/N: 508544-B21) and HP Smart Array P410 Controller (if not already part of the configuration)	
	NOTE: HP NHP Internal SAS/SATA 4 Port Cable Kit (487734-B21) is required when adding Smart Array P410 Controller to a non-hot plug SATA server model.	
HP Hard Drives	NOTE: The components of a storage subsystem (e.g. the drive, the HBA/controller, and the server backplane) should operate at the same data transfer rate or the system bandwidth will be negotiated down to an acceptable level for all components.	
	NOTE: Mixing SAS and SATA hard drives is allowed. However, only SAS hard drives will be used for RAID setting.	
	NOTE: Hard drives have either a one year or three year warranty; refer to the specific hard drive QuickSpecs for details.	
	SAS Non-Hot Plug LFF (3.5-inch) Enterprise (ENT) Drives	
	HP 600GB 6G SAS 15K rpm LFF (3.5-inch) Non-hot Plug Dual Port Enterprise 3yr Warranty Hard Drive	516830-B21
	HP 450GB 6G SAS 15K rpm LFF (3.5-inch) Non-hot Plug Dual Port Enterprise 3yr Warranty Hard Drive	516826-B21
	HP 300GB 6G SAS 15K rpm LFF (3.5-inch) Non-hot Plug Dual Port Enterprise 3yr Warranty Hard Drive	516824-B21
	NOTE: SAS hard drives require a SAS HBA or Smart Array Controller.	
	SATA Non-Hot Plug LFF (3.5-inch) Entry (ETY) Drives	
	HP 250GB 3G SATA 7.2K rpm LFF (3.5-inch) Non-hot Plug Entry 1yr Warranty Hard Drive	571232-B21
	HP 160GB 3G SATA 7.2K rpm LFF (3.5-inch) Non-hot Plug Entry 1yr Warranty Hard Drive	458947-B21
	SATA Non-Hot Plug LFF (3.5-inch) Midline (MDL) Drives	

	HP 2TB 3G SATA 7.2K rpm LFF (3.5-inch) Non-hot Plug Midline 1yr Warranty Hard Drive	507774-B21
	HP 1TB 3G SATA 7.2K rpm LFF (3.5-inch) Non-hot Plug Midline 1yr Warranty Hard Drive	507772-B21
	HP 500GB 3G SATA 7.2K rpm LFF (3.5-inch) Non-hot Plug Midline 1yr Warranty Hard Drive	458941-B21
HP Storage Controllers	SAS Controller	
	Smart Array P212 Controller	
	HP Smart Array P212/ZM 1-ports Int/1-ports Ext PCIe x8 SAS Controller	462828-B21
	HP Smart Array P212/256 1-ports Int/1-ports Ext PCIe x8 SAS Controller	462834-B21
	HP Smart Array P212/256 BBWC 1-ports Int/1-ports Ext PCIe x8 FIO SAS Controller	491191-B21
	Smart Array P410 Controller	
	HP Smart Array P410/256 2-ports Int PCIe x8 SAS Controller	462862-B21
	HP Smart Array P410/ZM 2-ports Int PCIe x8 FIO SAS Controller	462860-B21
	HP Smart Array P410/256 BBWC 2-ports Int PCIe x8 FIO SAS Controller	491195-B21
	HP Smart Array P410/512 BBWC 2-ports Int PCIe x8 SAS Controller	462864-B21
	HP Smart Array P410/512 FBWC 2-ports Int PCIe x8 SAS Controller	578230-B21
	HP Smart Array P410/1G FBWC 2-ports Int PCIe x8 SAS Controller	572532-B21
	NOTE: To support RAID 5, HP P410 requires at least 256MB Cache NOTE: To support RAID 6, HP P410 requires at least 256MB Cache + Battery + SAAP or 512MB BBWC + Smart Array Advanced Pack (SAAP) license key. Smart Array P411 Controller.	
	Smart Array P411 Controller	
	HP Smart Array P411/256 2-ports Ext PCIe x8 SAS Controller	462830-B21
	HP Smart Array P411/256 BBWC 2-ports Ext PCIe x8 FIO SAS Controller	491193-B21
	HP Smart Array P411/512 BBWC 2-ports Ext PCIe x8 SAS Controller	462832-B21
	HP Smart Array P411/512 FBWC 2-ports Ext PCIe x8 SAS Controller	578229-B21
	HP Smart Array P411/1G FBWC 2-ports Ext PCIe x8 SAS Controller	572531-B21
	Optional Upgrades	
	HP 1GB Flash Backed Cache	534562-B21
	HP 512MB Flash Backed Write Cache	534916-B21
	HP 512MB P-Series Battery Backed Write Cache Upgrade NOTE: Supported on HP Smart Array P410 Controller and HP Smart Array P411 Controller only.	462967-B21
	HP 256MB P-series Cache Upgrade NOTE: Supported on HP Smart Array P212 and HP Smart Array P410/ZM (FIO) Controller.	462968-B21
	HP 650 mAh P-Series Battery NOTE: To enable BBWC on the 256MB cache. NOTE: Supported on HP Smart Array P212 Controller, HP Smart Array P410 Controller, and HP Smart Array P411 Controller only.	462969-B21
	HP Smart Array Advanced Pack including 1yr 24x7 Technical Support and Updates Single Server License	516471-B21

	NOTE: Smart Array Advanced Pack (SAAP) is a license key to activate RAID 6 and the advance feature sets provided by the controller. This part number (516471-B21) can be used to purchase a single SAAP license or to order multiple licenses with a single activation key. Customers will receive a license entitlement certificate via e-mail. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Include one year of 24x7 HP Software Technical Support Services.	
	SCSI HBA	
	HP SC11Xe Ultra320 Single Channel/ PCIe x4 SCSI Host Bus Adapter NOTE: Recommended HBA for SCSI tape drive connection.	412911-B21
HP Power Supplies	Power Supplies	
	HP 460W Factory Integrated Power Supply Kit	500447-B21
	HP 750W Common Slot Gold Hot Plug Power Supply Kit NOTE: 750W RPS requires one (1) RPS Enablement Kit 5U G6 (P/N 508544-B21). NOTE: Two (2) 750W PSUs and one (1) RPS enablement kit are required to achieve redundancy. NOTE: The 2nd hot plug hard disk drive cage requires the purchase of 750W Redundant Power Supply, Redundant Power Supply Enablement Kit and HP Smart Array P410 Controller (if not already part of the configuration).	512327-B21
	Power Options	
	HP 5U G6 Redundant Power Supply Enablement Kit	508544-B21

Step 3: Choose Additional Options for Factory Integration

NOTE: For additional options, please refer to the "Core Options" and "Additional Options" sections below.

Core Options

NOTE: Some options may not be integrated at the factory. To ensure only valid configurations are ordered, HP recommends the use of an HP approved configurator. Contact your local sales representative for additional information.

HP Processors	Quad-Core Processors	
	HP ML150 G6 Intel® Xeon® E5540 (2.53GHz/4-core/8MB/80W) Processor Kit	507849-B21
	HP ML150 G6 Intel® Xeon® E5530 (2.40GHz/4-core/8MB/80W) Processor Kit	507848-B21
	HP ML150 G6 Intel® Xeon® E5520 (2.26GHz/4-core/8MB/80W) Processor Kit	507722-B21
	HP ML150 G6 Intel® Xeon® E5506 (2.13GHz/4-core/4MB/80W) Processor Kit	507847-B21
	HP ML150 G6 Intel® Xeon® E5504 (2.00GHz/4-core/4MB/80W) Processor Kit	507721-B21
	Dual-Core Processor	
	HP ML150 G6 Intel® Xeon® E5502 (1.86GHz/2-core/4MB/80W) Processor Kit	507720-B21
HP Memory	Registered DIMMs (RDIMMs)	
	HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500656-B21
	HP S-Buy 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500656-S21
	HP 4GB (1x4GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500658-B21
	HP S-Buy 4GB (1x4GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500658-S21
	HP 4GB (1x4GB) Quad Rank x8 PC3-8500 (DDR3-1066) Registered CAS-7 Low Power Memory Kit	500660-B21
	Unbuffered DIMMs (UDIMMs)	
	HP 1GB (1x1GB) Single Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	500668-B21
	HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	500670-B21
	HP S-Buy 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	500670-S21
	HP 4GB (1x4GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	500672-B21
	NOTE: All DDR3 memory option kits consist of one DIMM per kit. For detailed memory configuration rules and guidelines, please use the Online DDR3 Memory Configuration Tool: www.hp.com/go/ddr3memory-configurator. NOTE: Kits described as LP include Low Power DIMMs. For more information on ProLiant Energy Efficient Features, see: www.hp.com/go/proliant-energy-efficient	
HP Optical Drives	HP Half-Height SATA DVD-ROM Optical Drive	447326-B21
	HP Half-Height SATA DVD-RW Optical Drive	447328-B21

Core Options

HP Drive Cage Options	HP 5U Large Form Factor (LFF) Hot Plug Drive Cage Kit NOTE: A 2nd hot-plug hard disk drive cage option kit is needed to support more than 4 hard drives.	487737-B21
HP Hard Drives	NOTE: The components of a storage subsystem (e.g. the drive, the HBA/controller, and the server backplane) should operate at the same data transfer rate or the system bandwidth will be negotiated down to an acceptable level for all components. NOTE: Transfer rates of drives are dependent on the maximum transfer rate supported by the HBA or Controller. Refer to the HBA or Controller technical specifications for details. NOTE: Mixing SAS and SATA hard drives is allowed. However, only SAS hard drives will be used for RAID setting. NOTE: Hard drives have either a one year or three year warranty; refer to the specific hard drive QuickSpecs for details. NOTE: HP Smart Array B110i does not support greater than 2TB hard drive.	
	SATA Hot Plug LFF (3.5-inch) Midline (MDL) Drives	
	HP 3TB 3G SATA 7.2K rpm LFF (3.5-inch) Midline 1yr Warranty Hard Drive	628059-B21
	HP 2TB 3G SATA 7.2K rpm LFF (3.5-inch) Midline 1yr Warranty Hard Drive	507632-B21
	HP 1TB 3G SATA 7.2K rpm LFF (3.5-inch) Midline 1yr Warranty Hard Drive	454146-B21
	HP 1TB 3G SATA 7.2K rpm LFF (3.5-inch) Midline 1yr Warranty Hard Drive S-Buy	454146-S21
	HP 500GB 3G SATA 7.2K rpm LFF (3.5-inch) Midline 1yr Warranty Hard Drive	458928-B21
	HP 500GB 3G SATA 7.2K rpm LFF (3.5-inch) Midline 1yr Warranty Hard Drive S-Buy	458928-S21
	SATA Non-Hot Plug LFF (3.5-inch) Midline (MDL) Drives	
	HP 2TB 3G SATA 7.2K rpm LFF (3.5-inch) Non-hot Plug Midline 1yr Warranty Hard Drive	507774-B21
	HP 1TB 3G SATA 7.2K rpm LFF (3.5-inch) Non-hot Plug Midline 1yr Warranty Hard Drive	507772-B21
	HP 500GB 3G SATA 7.2K rpm LFF (3.5-inch) Non-hot Plug Midline 1yr Warranty Hard Drive	458941-B21
	SATA Non-Hot Plug LFF (3.5-inch) Entry (ETY) Drives	
	HP 250GB 3G SATA 7.2K rpm LFF (3.5-inch) Non-hot Plug Entry 1yr Warranty Hard Drive	571232-B21
	HP 160GB 3G SATA 7.2K rpm LFF (3.5-inch) Non-hot Plug Entry 1yr Warranty Hard Drive	458947-B21
	SATA Hot Plug LFF (3.5-inch) Entry (ETY) Drives	
	HP 250GB 3G SATA 7.2K rpm LFF (3.5-inch) Entry 1yr Warranty Hard Drive	571230-B21
	HP 160GB 3G SATA 7.2K rpm LFF (3.5-inch) Entry 1yr Warranty Hard Drive	458945-B21
	NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/13021_na/13021_na.html NOTE: The previous generations of 1.5G SATA non-hot plug hard drives are supported. These drives can be purchased as an option. However, they can no longer be configurable.	
	SAS Non-Hot Plug LFF (3.5-inch) Enterprise (ENT) Drives	
	HP 600GB 6G SAS 15K rpm LFF (3.5-inch) Non-hot Plug Dual Port Enterprise 3yr Warranty Hard Drive	516830-B21

Core Options

	HP 450GB 6G SAS 15K rpm LFF (3.5-inch) Non-hot Plug Dual Port Enterprise 3yr Warranty Hard Drive	516826-B21
	HP 300GB 6G SAS 15K rpm LFF (3.5-inch) Non-hot Plug Dual Port Enterprise 3yr Warranty Hard Drive	516824-B21
	SAS Hot Plug LFF (3.5-inch) Enterprise (ENT) Drives	
	HP 600GB 6G SAS 15K rpm LFF (3.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	516828-B21
	HP 450GB 6G SAS 15K rpm LFF (3.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	516816-B21
	HP 300GB 6G SAS 15K rpm LFF (3.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	516814-B21
	NOTE: SAS hard drives require a SAS HBA or Smart Array Controller.	
	SAS Hot Plug LFF (3.5-inch) Midline (MDL) Drives	
	HP 3TB 6G SAS 7.2K rpm LFF (3.5-inch) Midline 1yr Warranty Hard Drive	625031-B21
	HP 2TB 6G SAS 7.2K rpm LFF (3.5-inch) Dual Port Midline 1yr Warranty Hard Drive	507616-B21
	HP 1TB 6G SAS 7.2K rpm LFF (3.5-inch) Dual Port Midline 1yr Warranty Hard Drive	507614-B21
	NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/12244_na/12244_na.html	
HP Networking	Gigabit Ethernet adapters	
	HP NC112T PCI Express Gigabit Server Adapter	503746-B21
	HP NC360T PCI-E Dual Port Gigabit Server Adapter	412648-B21
	HP NC364T PCI-E Quad Port Gigabit Server Adapter	435508-B21
	HP NC373F PCI-E Multifunction 1000SX Gigabit Svr Adapter	394793-B21
	HP NC373T PCI-E Multifunction Gigabit Server Adapter	394791-B21
	HP NC375T PCI Express Quad Port Gigabit Server Adapter	538696-B21
	HP NC382T PCI Express Dual Port Multifunction Gigabit Server Adapter	458492-B21
	NOTE: Please see the QuickSpecs for Technical Specifications and additional information: www.hp.com/go/ProLiantNICs	

Core Options

HP Power Supplies	Power Supplies	
	HP 750W Common Slot Gold Hot Plug Power Supply Kit NOTE: 750W RPS requires a Redundant Power Supply Enablement Kit 5U G6 (P/N 508544-B21). Two (1) 750W PSUs and one (1) RPS enablement kit are required to achieve redundancy.	512327-B21
	Power Options	
	HP 5U G6 Redundant Power Supply Enablement Kit	508544-B21
HP Cooling Options	HP 5U G6 Redundant Fan Kit NOTE: Option Kits contain optional power supply, an IEC power cable and PDU IEC cables. NOTE: Two (2) fans ship standard for 1P configuration. For redundancy, please order a redundant fan option kit (513927-B21) which ships with 2 fans. NOTE: Three (3) fans ship standard for 2P configuration. If customer orders the standalone redundant fan option kit (513927-B21), two (2) fans in a two-fan packaged box will be received. Only one (1) fan is required for system redundancy. The other one can be saved as a spare part. NOTE: If customer orders the redundant fan kit along with the server, the extra fan will not be received.	513927-B21

Additional Options

NOTE: Some options may not be integrated at the factory. To ensure only valid configurations are ordered, HP recommends the use of an HP approved configurator. Contact your local sales representative for additional information.

HP Entry-Level Server Management	HP Lights-Out 100i (LO100i) Advanced including 1yr 24x7 Support Single Server License NOTE: Other license types available, please check LO100i Advanced QuickSpecs at: http://www.hp.com/go/lo100 for more details.	530521-B21
HP Port Options	HP Non-Hot Plug Internal SAS/SATA 4 Port Cable Kit NOTE: This cable is required when adding Smart Array P410 Controller on Non-Hot Plug SATA/SAS server models.	487734-B21
HP Security - TPM	HP Trusted Platform Module Option NOTE: The TPM (Trusted Platform Module) is a microcontroller chip that can securely store artifacts used to authenticate the server platform. These artifacts can include passwords, certificates and encryption keys. Windows® BitLocker™ Drive Encryption (BitLocker) is a data protection feature available in Windows Server® 2008. BitLocker leverages the enhanced security capabilities of a Trusted Platform Module (TPM) version 1.2. The TPM works with BitLocker to help protect user data and to ensure that a server running Windows Server 2008 has not been tampered with while the system was offline. NOTE: For more information about TPM, including a white paper, go to: www.hp.com/go/TPM NOTE: ProLiant OS pre-installed units will come with the partition required for TPM deployment. NOTE: The TPM key is unique to every TPM deployed server and must be retained. Misplacing or losing the key could result in data loss.	488069-B21
HP Storage Controllers	SAS Controller	
	Smart Array P212 Controller	
	HP Smart Array P212/ZM 1-ports Int/1-ports Ext PCIe x8 SAS Controller	462828-B21
	HP Smart Array P212/256 1-ports Int/1-ports Ext PCIe x8 SAS Controller	462834-B21
	Smart Array P410 Controller	
	HP Smart Array P410/256 2-ports Int PCIe x8 SAS Controller	462862-B21
	HP Smart Array P410/512 BBWC 2-ports Int PCIe x8 SAS Controller	462864-B21
	HP Smart Array P410/512 FBWC 2-ports Int PCIe x8 SAS Controller	578230-B21
	HP Smart Array P410/1G FBWC 2-ports Int PCIe x8 SAS Controller	572532-B21
	NOTE: To support RAID 5, HP P410 requires at least 256 MB Cache. NOTE: To support RAID 6, HP P410 requires at least 256 MB Cache + Battery + SAAP or 512MB BBWC + SAAP.	
	Smart Array P411 Controller	
	HP Smart Array P411/256 2-ports Ext PCIe x8 SAS Controller	462830-B21
	HP Smart Array P411/512 BBWC 2-ports Ext PCIe x8 SAS Controller	462832-B21
	HP Smart Array P411/512 FBWC 2-ports Ext PCIe x8 SAS Controller	578229-B21
	HP Smart Array P411/1G FBWC 2-ports Ext PCIe x8 SAS Controller	572531-B21

Optional Upgrades	
HP 256MB P-series Cache Upgrade NOTE: Supported on HP Smart Array P212 and HP Smart Array P410/ZM (FIO) Controller.	462968-B21
HP 1GB Flash Backed Cache	534562-B21
HP 512MB Flash Backed Write Cache	534916-B21
HP 512MB P-Series Battery Backed Write Cache Upgrade NOTE: Supported on HP Smart Array P410 Controller and HP Smart Array P411 Controller only.	462967-B21
HP 650 mAh P-Series Battery NOTE: To enable BBWC on the 256MB cache. NOTE: Supported on HP Smart Array P212 Controller, HP Smart Array P410 Controller, and HP Smart Array P411 Controller only.	462969-B21
HP Non-Hot Plug Internal SAS/SATA 4 Port Cable Kit NOTE: NHP Internal SAS/SATA 4 Port Cable (487734-B21) is required when adding Smart Array P410 Controller on Non-Hot Plug SATA/SAS server models.	487734-B21
HP Smart Array Advanced Pack including 1yr 24x7 Technical Support and Updates Single Server License NOTE: Smart Array Advanced Pack (SAAP) is a license key to activate RAID 6 and the advance feature sets provided by the controller. This part number (516471-B21) can be used to purchase a single SAAP license or to order multiple licenses with a single activation key. Customers will receive a license entitlement certificate via e-mail. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Include one year of 24x7 HP Software Technical Support Services. NOTE: Please see the following QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/13203_na/13203_na.html (Smart Array P212 Controller) http://h18000.www1.hp.com/products/quickspecs/13201_na/13201_na.html (Smart Array P410 Controller) http://h18000.www1.hp.com/products/quickspecs/13202_na/13202_na.html (Smart Array P411 Controller)	516471-B21
SCSI HBA	
HP SC11Xe Ultra320 Single Channel/ PCIe x4 SCSI Host Bus Adapter NOTE: Please see the following QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/12566_na/12566_na.html (SC11Xe HBA)	412911-B21

Additional Options

HP Backup & Recovery Software	Data Protector Express	
	HP Data Protector Express V5.0 for 1 Server E-LTU	TC330AAE
	HP Data Protector Express V5.0 for 10 Servers E-LTU	TC332AAE
	HP Data Protector Express V5.0 for 1 Server E-LTU	TC330AAE
	HP Data Protector Express V5.0 for 3 Servers E-LTU	TC331AAE
	NOTE: Only one of these Data Protector Express base products is required. To see available options: http://www.hp.com/go/dataprotectorexpress	
HP Tape Backup	NOTE: For the complete range of tape drives, autoloaders, libraries and media see: http://www.hp.com/go/tape. For hardware and software compatibility of HP tape backup products see: http://www.hp.com/go/connect.	
	NOTE: Connection using HP P212 Smart Array Controller SAS (462828-B21) recommended.	
	HP DAT 320 USB Internal Tape Drive	AJ825A
	HP DAT 320 SAS Internal Tape Drive	AJ830A
	HP Ultrium 448 SAS Internal Drive	DW085A
	HP Ultrium 920 SAS Internal Tape Drive	EH847A
	HP 1/8 G2 Ultrium 920 SAS Autoloader	AH558A
	NOTE: Requires HP 1U Tape Autoloader Rack-Mount Kit (AH166A) for rack installation.	
	HP MSL2024 Ultrium 920 SAS Tape Library	AH559A
	HP MSL2024 1 LTO-5 Ultrium 3000 SAS Tape Library	BL537A
HP Disk Backup	NOTE: For the complete range of D2D Backup Systems see: http://www.hp.com/go/d2d. For the complete range of RDX drives and media see: http://www.hp.com/go/rdx. For hardware and software compatibility of HP disk backup products see: http://www.hp.com/go/connect.	
	HP D2D Backup Systems with Backup Data Deduplication	
	NOTE: These are network connected appliances with connectivity using the iSCSI protocol. If the server requires a hardware iSCSI initiator, the QLogic QLA4050 Host Bus Adapter is recommended.	
	HP D2D2502i Backup System	EJ001B
	NOTE: 1.5TB of usable network disk backup capacity. Network connected appliance with connectivity using the iSCSI protocol. If the server requires a hardware iSCSI initiator, the QLogic QLA4050 Host Bus Adapter is recommended.	
	HP D2D2504i Backup System	EJ002B
	NOTE: 3.0TB of usable network disk backup capacity. Network connected appliance with connectivity using the iSCSI protocol. If the server requires a hardware iSCSI initiator, the QLogic QLA4050 Host Bus Adapter is recommended.	
	HP RDX1000 Internal Removable Disk Backup System	BV847A
	USB Removable Media RDX Disk Backup Systems	
	HP RDX320 Internal Removable Disk Backup System	AJ767A
	NOTE: 320GB of disk capacity per data cartridge.	
	HP RDX500 Internal Removable Disk Backup System	AJ934A
	NOTE: 500GB of disk capacity per data cartridge.	

HP Uninterruptible Power Systems	HP Tower UPS	
	HP R/T3000 G2 Uninterruptible Power System (UPS)	
	HP R/T3000 G2 2U L530 Low Voltage Uninterruptible Power System	AF466A
	HP R/T3000 G2 2U L620 High Voltage Uninterruptible Power System	AF467A
	NOTE: Please see the QuickSpecs for additional information: http://h18000.www1.hp.com/products/quickspecs/14058_na/14058_na.html	
	HP R1500 G3 Uninterruptible Power Supply (UPS)	
	HP R1.5kVA G3 1U Uninterruptible Power System	AF469A
	NOTE: Please see the QuickSpecs for additional information: http://h18000.www1.hp.com/products/quickspecs/14059_na/14059_na.html	
	R5000 Uninterruptible Power System (UPS)	
	HP R5KVA 3U L630 High Voltage Uninterruptible Power System	AF460A
	R7000 Uninterruptible Power System (UPS)	
	HP R7KVA 4U 50A High Voltage Uninterruptible Power System	AF462A
	HP T1000 G3 UPS Models	
	HP T1000 G3 1000VA Tower Uninterruptible Power System	AF448A
	NOTE: Please see QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/13160_na/13160_na.html	
	HP T750 G2 UPS Models	
	HP T750 G2 750VA Tower Uninterruptible Power System	AF446A
	HP T1500 Uninterruptible Power System (UPS)	
	HP T1500 G3 1400VA Tower Uninterruptible Power System	AF450A
	NOTE: Please see the QuickSpecs for additional information: http://h18000.www1.hp.com/products/quickspecs/13417_na/13417_na.html	
	NOTE: For additional information on sizing your server, please reference: http://www.upssizer.com	
	NOTE: Please see the UPS and PDU cable matrix's on the HP Power Protection and Management page. Under Power Cords, click on the "HP Power Cord Matrix" link. That link will list cable descriptions, requirements, and specifications for UPS and PDU units. Please see the following link: www.hp.com/products/powercords.	

Additional Options

HP Rack Series	HP 10642 G2 Pallet Universal Rack	AF001A
	HP 10642 G2 Shock Universal Rack	AF002A

NOTE: The increasing power of new high-performance processor technology requires increased cooling efficiency for rack-mounted servers. The 10000 G2 Series Racks provide enhanced airflow for maximum cooling, allowing these racks to be fully loaded with servers using the latest processors.

CAUTION: If a third-party rack is used, observe the following additional requirements to ensure adequate airflow and to prevent damage to the equipment:

- Front and rear doors: If your 42U server rack includes closing front and rear doors, you must allow 830 square inches (5,350 sq cm) of hole evenly distributed from top to bottom to permit adequate airflow (equivalent to the required 64 percent open area for ventilation).
- Side: The clearance between the installed rack component and the side panels of the rack must be a minimum of 2.75 inches (7 cm).

CAUTION: Always use blanking panels to fill all remaining empty front panel U-spaces in the rack. This arrangement ensures proper airflow. Using a rack without blanking panels results in improper cooling that can lead to thermal damage.

NOTE: HP ProLiant DL rack models have fixed rails which provide support for racks with round mounting holes and tool-free support for racks with square mounting holes (including Compaq/HP 7000, 9000, 10000 and HP series), with an adjustment range of 26" - 36".

NOTE: Support for all 2 and 4 post Telco racks and threaded hole racks requires an additional option kit from Rack Solutions. The Rack Solutions brackets can be purchased at: www.hp.com/go/rackandpower.

HP Rack Options

HP KVM Switch Options

HP 1x1Ex8 KVM IP Console Switch G2 with Virtual Media CAC Software	AF620A
HP 2x1Ex16 KVM IP Console Switch G2 with Virtual Media CAC Software	AF621A
HP 4x1Ex32 KVM IP Console Switch G2 with Virtual Media CAC Software	AF622A

NOTE: Please see the QuickSpecs for Technical Specifications and additional information:
http://h18000.www1.hp.com/products/quickspecs/13474_na/13474_na.html

HP Server Console Switches

HP Server Console 0x2x8 Port Analog Switch	AF616A
HP Server Console 0x2x16 Port Analog Switch	AF617A

NOTE: Please see the QuickSpecs for Technical Specifications and additional information:
http://h18000.www1.hp.com/products/quickspecs/11834_na/11834_na.html

HP Server Console Switch G2 with Virtual Media & CAC

HP 0x2x16 KVM Server Console Switch G2 with Virtual Media CAC Software	AF618A
HP 0x2x32 KVM Server Console Switch G2 with Virtual Media CAC Software	AF619A

NOTE: Please see the QuickSpecs for Technical Specifications and additional information:
http://h18000.www1.hp.com/products/quickspecs/13475_na/13475_na.html

Additional Options

	NOTE: For additional information regarding KVM switches, Serial Console servers, rack mount monitors, keyboards and all related options please see the following URL: http://www.hp.com/go/kvm.	
	Rack Kits	
	HP Tower to Rack Conversion Tray Universal Kit	417705-B21
HP USB and SD Options	HP USB 2-Button Optical Scroll Mouse	DC172B
	HP USB 04 Standard Keyboard	DT528A#ABA
	NOTE: For the installation of Windows and other OS's, a floppy drive or the HP USB Floppy Drive Key may be required to complete driver installation. A standard USB drive key may not work to complete driver installation.	
HP Care Pack Services	Extended Care	
	HP 3 year Next business day ProLiant ML150 Hardware Support	U8184E
	Committed Care	
	HP 3 year 4 hour 13x5 ProLiant ML150 Hardware Support	U8192E
	Deployment Services	
	HP Install ProLiant ML150 Service	U8195E
Smart Buy Care Pack Services	HP S-Buy 4-Hour Onsite Response, 13-Hour x 5-Day Coverage, 3 years	UE897E
	HP S-Buy 4-Hour Onsite Response, 24-Hour x 7-Day Coverage, 3 years	UE898E
	HP SBuy3y24x7 24hCTRProliant ML150HW Sup	HZ753E
	NOTE: Smart Buy Care Packs can only be attached to Smart Buy SKUs	
	NOTE: For more information, customer/resellers can contact: http://www.hp.com/services/carepack.	

HP ProLiant ML150 G6 Memory Population Guidelines

NOTE: Memory configurations listed do not apply to "Factory Integrated Models".

NOTE: Charts do not represent all possible memory configurations. Memory must be populated in one of the following ways.

For detailed memory configuration rules and guidelines, please use the Online DDR3 Memory Configuration Tool: www.hp.com/go/ddr3memory-configurator

Some DIMM installation guidelines are summarized below:

- For the HP ProLiant ML150 G6 server with twelve (12) memory slots
- There are three (3) channels per processor; six (6) channels per server
- There are two (2) DIMM slots for each memory channel; twelve (12) total slots
- Memory channel 1 consists of the two (2) DIMMs that are closest to the processor
- Memory channel 3 consists of the two (2) DIMMs that are furthest from the processor
- DIMM slots that are white should be populated first
- Do not mix Unbuffered memory (UDIMMs) with Registered memory (RDIMMs)
- Do not install DIMMs if the corresponding processor is not installed
- If only one processor is installed in a 2CPU system, only half of the DIMM slots are available
- To maximize performance, balance the total memory capacity between all installed processors
- It is not required, but it is recommended to load the channels similarly if possible
- You can only have up to eight (8) ranks installed per channel
- You can only install two quad-rank DIMMs per channel
- You can only install two UDIMMs per channel; if available, the third slot in the channel must remain empty
- Populate DIMMs from heaviest load (quad-rank) to lightest load (single-rank) within a channel
- Heaviest load (DIMM with most ranks) within a channel goes furthest from the chipset
- For memory mirroring mode, channel 3 must be unpopulated. Channels 1 and 2 are populated identically
- For lock-step mode, channel 3 must be unpopulated. DIMMs in channels 1 and 2 will be installed in pairs. The paired slots will be 1,4; 2,5; 3;6 on a 3DPC system or 1,4; 2,5; on a 2DPC system
- No mixing DIMM voltage; all DIMMs must be the same voltage

DIMM Type	Registered DIMMs (RDIMMs)				Unbuffered DIMMs (UDIMMs)			
DIMM Rank	Dual Rank (2R)		Quad Rank (4R)		Single Rank (1R)		Dual Rank (2R)	
DIMM Capacity	2GB	4GB	2GB	4GB	1GB	2GB	2GB	4GB
DIMM Native Speed (MHz)	1333	1333	*	1066	1333	*	1333	1333
SLOTS THAT CAN BE POPULATED								
12 slot servers	12	12	*	12	12	*	12	12
MAXIMUM CAPACITY (GB)								
12 slot servers	24	48	*	48	12	*	24	48
POPULATED DIMM SPEED (MHz)								
1 DIMM Per Channel	1333	1333	*	1066	1333	*	1333	1333
2 DIMM Per Channel	1066	1066	*	800	1066	*	1066	1066
* - not supported by HP at this time.								

NOTES:

- Mixing DIMM speeds is allowed, but the system processor speed rules always override the DIMM capabilities
- If you do mix DIMM speeds, the memory bus will default to the minimum clock rate of all DIMMs in the system - even if the slower DIMM is on the other processor
- If you install 1x 1066MHz DIMM in channel 1 and 1x 1333MHz DIMM in channel 2, you still run at 1066MHz

Memory

- If you install 1x 1066MHz DIMM in channel 1 and 5x 1333MHz DIMMs with 1 DIMM Per Channel (DPC) in each of the other channels, you run at 1066MHz
- If you install 3DPC in one channel (if applicable) and 1DPC in all other channels, you run at 800MHz
- 95 Watt CPU's are required for 1333MHz DIMM speeds
- References to the above MHz speeds are for the various speeds of DDR3 DIMMs; 1333 refers to DDR3-1333, etc.

Standard Memory
All HP ML150 G6 models ship with 12 DIMM sockets.

Factory Integrated Models include the memory capacity of your choice.

Basic memory slot and population diagram

- Population order; start with "A" first, "B" second, "C" third, etc.

12 DIMM SLOTS (6 per CPU node)					
	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	D	1	D	Chnl 1
	2	A	2	A	
Chnl 2	3	E	3	E	Chnl 2
	4	B	4	B	
Chnl 3	5	F	5	F	Chnl 3
	6	C	6	C	

Standard Memory (1 CPU model)
Hot Plug SAS/SATA performance and base models include 2 x 2 GB UDIMM and 1 x 2 GB UDIMM respectively
Non-Hot Plug SATA entry models include 1 x 2 GB UDIMM

- 4 GB (2 x 2GB) of PC3-10600 (DDR3-1066) Advanced ECC UDIMMs

	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	D: empty	1	D: empty	Chnl 1
	2	A: 2GB DIMM	2	A: empty	
Chnl 2	3	E: empty	3	E: empty	Chnl 2
	4	B: 2GB DIMM	4	B: empty	
Chnl 3	5	F: empty	5	F: empty	Chnl 3
	6	C: empty	6	C: empty	

Standard memory plus Optional Memory (1 CPU model)

- 18GB, consisting of three (3) 2GB RDIMMs plus three (3) 4GB RDIMMs)
  - 3x 2GB dual-rank PC3-10600 RDIMMs
  - 3x 4GB dual-rank PC3-10600 RDIMMs

Memory

	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	D: 2GB DIMM	1	D: empty	Chnl 1
	2	A: 4GB DIMM	2	A: empty	
Chnl 2	3	E: 2GB DIMM	3	E: empty	Chnl 2
	4	B: 4GB DIMM	4	B: empty	
Chnl 3	5	F: 2GB DIMM	5	F: empty	Chnl 3
	6	C: 4GB DIMM	6	C: empty	

Standard memory Replaced with Optional Memory (1 CPU model)
RDIMM maximum configuration

- 24GB, consisting of six (6) 4GB dual-rank PC3-10600 RDIMMs

	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	D: 4GB DIMM	1	D: empty	Chnl 1
	2	A: 4GB DIMM	2	A: empty	
Chnl 2	3	E: 4GB DIMM	3	E: empty	Chnl 2
	4	B: 4GB DIMM	4	B: empty	
Chnl 3	5	I: 4GB DIMM	5	I: empty	Chnl 3
	6	C: 4GB DIMM	6	C: empty	

UDIMM Maximum Configuration (1 CPU model)

- 24GB, consisting of six (6) 4GB dual-rank PC3-10600 UDIMMs

	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	D: 4GB DIMM	1	D: empty	Chnl 1
	2	A: 4GB DIMM	2	A: empty	
Chnl 2	3	E: 4GB DIMM	3	E: empty	Chnl 2
	4	B: 4GB DIMM	4	B: empty	
Chnl 3	5	F: 4GB DIMM	5	F: empty	Chnl 3
	6	C: 4GB DIMM	6	C: empty	

Standard memory Replaced with Optional Memory (2 CPU model)
RDIMM maximum configuration

- 48GB, consisting of twelve (12) 4GB dual-rank PC3-10600 RDIMMs

Memory

	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	D: 4GB DIMM	1	D: 4GB DIMM	Chnl 1
	2	A: 4GB DIMM	2	A: 4GB DIMM	
Chnl 2	3	E: 4GB DIMM	3	E: 4GB DIMM	Chnl 2
	4	B: 4GB DIMM	4	B: 4GB DIMM	
Chnl 3	5	F: 4GB DIMM	5	F: 4GB DIMM	Chnl 3
	6	C: 4GB DIMM	6	C: 4GB DIMM	

UDIMM maximum configuration (2 CPU model)

- 48GB, consisting of twelve (12) 2GB dual-rank PC3-10600 UDIMMs

	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	D: 4GB DIMM	1	D: 4GB DIMM	Chnl 1
	2	A: 4GB DIMM	2	A: 4GB DIMM	
Chnl 2	3	E: 4GB DIMM	3	E: 4GB DIMM	Chnl 2
	4	B: 4GB DIMM	4	B: 4GB DIMM	
Chnl 3	5	F: 4GB DIMM	5	F: 4GB DIMM	Chnl 3
	6	C: 4GB DIMM	6	C: 4GB DIMM	

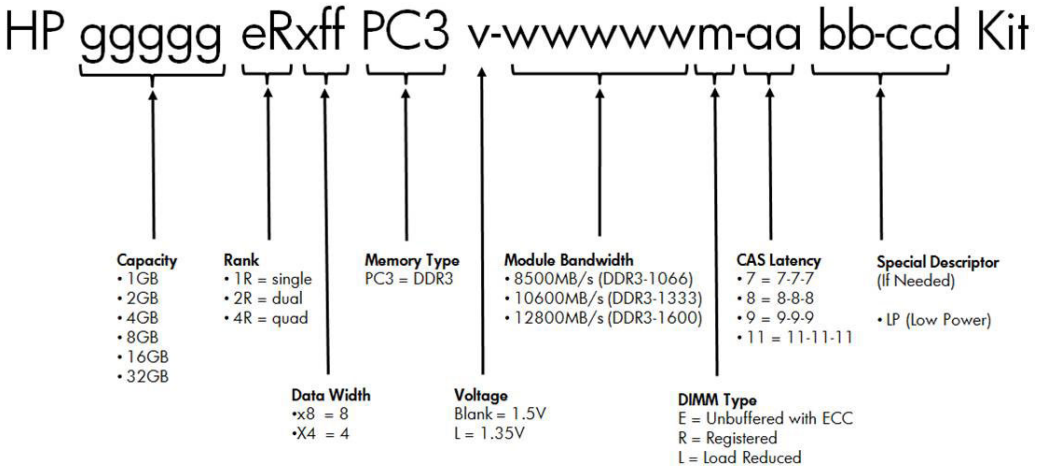
NOTE: Capacity references are rounded to the common Gigabyte values.

- 1GB = 1024MB
- 2GB = 2048MB
- 4GB = 4096MB
- 8GB = 8192MB

For detailed memory configuration rules and guidelines, please use the Online DDR3 Memory Configuration Tool: http://www.hp.com/go/ddr3memory-configurator

DDR3 memory options part number decoder

Memory



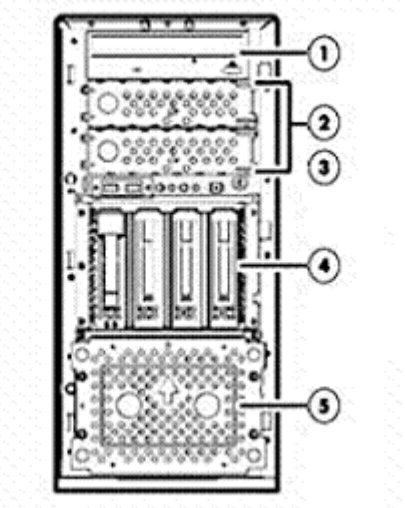
Following are memory options available from HP:

HP Memory	Registered DIMMs (RDIMMs)	
	HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500656-B21
	HP 4GB (1x4GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500658-B21
	HP 4GB (1x4GB) Quad Rank x8 PC3-8500 (DDR3-1066) Registered CAS-7 Low Power Memory Kit	500660-B21
	Unbuffered DIMMs (UDIMMs)	
	HP 1GB (1x1GB) Single Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	500668-B21
	HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	500670-B21
	HP 4GB (1x4GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	500672-B21

NOTE: All DDR3 memory option kits consist of one DIMM per kit. For detailed memory configuration rules and guidelines, please use the Online DDR3 Memory Configuration Tool: www.hp.com/go/ddr3memory-configurator.

NOTE: Kits described as LP include Low Power DIMMs. For more information on ProLiant energy efficient features, see: www.hp.com/go/proliant-energy-efficient

Non-Hot Plug SATA or Hot Plug SAS/SATA



1	Optical Drive Media Bay
2	Media Bays
3	USB 2.0 ports (2)
4	Hard Drive Bays (1-4)
5	Hard Drive Bays (5-8)

Drive Support

	Quantity Supported	Position Supported	Controller
Removable Media			
SATA DVD-ROM Drive	Up to 1	1	SATA

Hard Drives

NOTE: The components of a storage subsystem (e.g. the drive, the HBA/controller, and the server backplane) should operate at the same data transfer rate or the system bandwidth will be negotiated down to an acceptable level for all components.

NOTE: Supports up to eight (8) SAS/SATA hard drives via 2nd Hot plug Hard Disk Drive cage and HP Smart Array P410 Controller.

NOTE: The 2nd hot-plug hard drive cage requires the purchase of one 750W hot plug power supply, Redundant Power Supply Enablement Kit and HP Smart Array P410 Controller (if not already part of the configuration).

NOTE: Hard drives have either a one year or three year warranty; refer to the specific hard drive QuickSpecs for details.

SATA Hot Plug LFF (3.5-inch) Midline (MDL) Drives

	Quantity Supported	Position Supported	Controller
3TB 3G SATA 7.2K 2TB 3G SATA 7.2K 1TB 3G SATA 7.2K 500GB 3G SATA 7.2K	Up to 8	4,5 (Drive slots 1-8)	Smart Array P212 Controller Smart Array P410 Controller Smart Array P411 Controller

SATA Non-Hot Plug LFF (3.5-inch) Midline (MDL) Drives

	Quantity Supported	Position Supported	Controller

Storage

2TB 3G SATA 7.2K 1TB 3G SATA 7.2K 500GB 3G SATA 7.2K	Up to 4	4 (Drive slots 1-4)	HP Smart Array B110i SATA RAID Controller (RAID 0,1,10) Smart Array P212 Controller Smart Array P410 Controller Smart Array P411 Controller NOTE: Hardware Raid 5 requires a Smart Array P212/P410/P411 Controllers.

SATA Non-Hot Plug LFF (3.5-inch) Entry (ETY) Drives

	Quantity Supported	Position Supported	Controller
250GB 3G SATA 7.2K 160GB 3G SATA 15K	Up to 4	4 (Drive slots 1-4)	HP Smart Array B110i SATA RAID Controller (RAID 0,1,10)) Smart Array P212 Controller Smart Array P410 Controller Smart Array P411 Controller NOTE: Hardware Raid 5 requires a Smart Array P212/P410/P411 Controllers.

SATA Hot Plug LFF (3.5-inch) Entry (ETY) Drives

	Quantity Supported	Position Supported	Controller
250GB 3G SATA 7.2K 160GB 3G SATA 7.2K	Up to 8	4,5 (Drive slots 1-8)	Smart Array P212 Controller Smart Array P410 Controller Smart Array P411 Controller

SAS Non-Hot Plug LFF (3.5-inch) Enterprise (ENT) Drives

	Quantity Supported	Position Supported	Controller
600GB 6G SAS 15K 450GB 6G SAS 15K 300GB 6G SAS 15K	Up to 4	4 (Drive slots 1-8)	Smart Array P212 Controller Smart Array P410 Controller Smart Array P411 Controller

SAS Hot Plug LFF (3.5-inch) Enterprise (ENT) Drives

	Quantity Supported	Position Supported	Controller
600GB 6G SAS 15K 450GB 6G SAS 15K 300GB 6G SAS 15K	Up to 8	4,5 (Drive slots 1-8)	Smart Array P212 Controller Smart Array P410 Controller Smart Array P411 Controller

SAS Hot Plug LFF (3.5-inch) Midline (MDL) Drives

	Quantity Supported	Position Supported	Controller
3TB 6G SAS 7.2K 2TB 6G SAS 7.2K 1TB 6G SAS 7.2K	Up to 8	4,5 (Drive slots 1-8)	Smart Array P212 Controller Smart Array P410 Controller Smart Array P411 Controller

Storage

NOTE: To support 8 drives, the purchase of the optional 2nd hot plug drive cage, 750W Redundant Power Supply, Redundant Power Supply Enablement Kit and HP Smart Array P410 Controller (if not already part of the configuration) are required.

Maximum Storage Capacity - SAS Models

Internal	24.0TB (8 x 3TB SAS hard drives)
Total	24.0TB (8 x 3TB SAS hard drives)

Maximum Storage Capacity - SATA Models

Internal	24.0TB (8 x 3TB SATA drives)
Total	24.0TB (8 x 3TB SATA drives)

Tape and Disk-Based Backup

NOTE: For the complete range of tape drives, autoloaders, libraries and media, including the internal fitting models, see: http://www.hp.com/go/tape. For the complete range of D2D Backup Systems see: http://www.hp.com/go/d2d. For the complete range of RDX drives and media see: http://www.hp.com/go/rdx. For hardware and software compatibility of HP disk and tape backup products see: http://www.hp.com/go/connect.

	Position	Recommended Controller	Part Number
HP SCSI Tape Drives LTO-1 Ultrium 232 LTO-2 Ultrium 448 LTO-3 Ultrium 920 LTO-3 Ultrium 960 LTO4 Ultrium 1760 LTO-4 Ultrium 1840 DAT 40 DAT 72 DAT 160	Internal or External	HP SC11Xe Ultra320 Single Channel/ PCIe x4 SCSI Host Bus Adapter	412911-B21
HP SCSI Rack Mount Kits 1U Rack-Mount Kit 3U Rack-Mount Kit	External	HP SC11Xe Ultra320 Single Channel/ PCIe x4 SCSI Host Bus Adapter	412911-B21
HP USB Tape Drives DAT 40 DAT 72 DAT 160 DAT 320	Internal or External	USB 2.0 Port	N/A
HP USB Rack Mount Kits 1U USB Rack-Mount Kit	External	USB 2.0 Port	N/A
HP SAS Tape Drives DAT 160 DAT 320 LTO-2 Ultrium 448 LTO-3 Ultrium 920 LTO-4 Ultrium 1760 LTO-4 Ultrium 1840 LTO-5 Ultrium 3000	Internal or External	HP Smart Array P212/ZM 1-ports Int/1-ports Ext PCIe x8 SAS Controller	462828-B21

Storage

LTO-5 Ultrium 3280

HP SAS Rack Mount Kits 1U Rack-Mount Kit 3U Rack-Mount Kit	External	HP Smart Array P212/ZM 1-ports Int/1-ports Ext PCIe x8 SAS Controller	462828-B21
HP SCSI Tape Autoloaders DAT 72x10 Autoloader 1/8 G2 Autoloader	External	HP SC11Xe Ultra320 Single Channel/ PCIe x4 SCSI Host Bus Adapter	412911-B21
HP SCSI Tape Libraries MSL2024 MSL4048 MSL8096 MSL6000	External	HP U320e SCSI Dual Channel Host Bus Adapter	AH627A
HP SAS Tape Autoloaders and Libraries 1/8 G2 Autoloader MSL2024 MSL4048 MSL8096	External	HP Smart Array P212/ZM 1-ports Int/1-ports Ext PCIe x8 SAS Controller	462828-B21
HP Fibre Channel Tape Libraries MSL2024 MSL4048 MSL8096 MSL6000	External	Please consult the EBS connectivity matrix at: http://www.hp.com/go/ebs for connectivity information and the supported Fibre Channel HBAs shown in this QuickSpecs.	
HP USB RDX Removable Disk Backup System RDX160 RDX320 RDX500 RDX750	Internal or External	USB 2.0 port	N/A
HP D2D Backup Systems, iSCSI D2D2500i D2D4000i	External	Embedded Network Controller. If the server requires a hardware iSCSI initiator, the QLogic QLA4050 Host Bus Adapter is recommended.	
HP D2D Backup Systems, Fibre Channel D2D4000fc	External	Direct server attach is not supported, requires connection via SAN fabric. See: http://www.hp.com/go/connect	

Power Specifications

HP 460W Factory Integrated Power Supply Kit						
Part Number	500447-B21					
Operational Input Voltage Range (Vrms)	90 to 135 and 180 to 264 V ac full ranging					
Frequency Range (Nominal) (Hz)	47 to 66 Hz					
Nominal Input Voltage (Vrms)	100	115	208	220	230	240
Max Rated Output Wattage Rating	460	460	460	460	460	460
Nominal Input Current (A rms)	10	10	5	5	5	5
Max Rated Input Wattage Rating (Watts)	760	760	700	700	700	700
Max. Rated VA (Volt-Amp)	850	850	830	830	830	830
Efficiency (%)	65	65	65	65	65	65
Power Factor	0.9	0.9	0.9	0.9	0.9	0.9
Leakage Current (mA)	3.5mA	3.5mA	3.5mA	3.5mA	3.5mA	3.5mA
Maximum Inrush Current (A peak)	450	450	450	450	450	450
Maximum Inrush Current duration (mS)						

HP 750W Common Slot Gold Hot Plug Power Supply Kit (Optional)							
Part Number	512327-B21						
HP RPS Enablement Kit Part Number	508544-B21						
Input Voltage Range (V rms)	100 to 240						
Frequency Range (Nominal) (Hz)	50/60						
Nominal Input Voltage (Vrms)	100	120	200	208	220	230	240
Maximum Rated Output Wattage Rating	750	750	750	750	750	750	750
Nominal Input Current (A rms)	8.9	7.4	4.3	4.1	3.9	3.7	3.6
Maximum Rated Input Wattage Rating (Watts)	857	847	824	824	820	820	820
Maximum Rated VA (Volt-Amp)	894	884	859	854	854	854	
Efficiency (%)	87.5	88.5	91	91	91.5	91.5	91.5
Power Factor	0.97						
Leakage Current (mA)	0.42	0.50	.83	0.87	0.92	0.96	1.00
Maximum Inrush Current (A peak)	30						
Maximum Inrush Current duration (mS)	20						
Maximum British Thermal Unit Rating (BTU-Hr)	2925	2892	2812	2812	2797	2797	2797

System Specifications

	Power**
HP ProLiant ML150 G6 Fully Configured	(see**)
Fully Loaded System Input Wattage (W)	567W (595W)
Fully Loaded System Input Current (A rms)	4.78A (5.1A) @ 115V, 2.38A (2.55A) @ 230V
Fully Loaded System Thermal (BTU- Hr)r)	1794 BTU/526W (1933BTU/595W)
Fully Loaded System VA (Volt-Amp)	568.1 (601)
System Leakage with all power supplies loaded (mA)	0.7mA (1.25mA)
System Inrush Current with all power supplies loaded (A)	50A (37.6A)
Power cord requirements	Nema 5-15P to IEC320-C13
	IEC320-C13 to IEC320-C14
**Power shown is for a fully configured system consisting of:	
(2) CPUs up to 80W (95W), 2.4G (2.93G) (12) 2GB UDIMMs or 10 2GB RDIMMs (12pc 4G RDIMM) (4) HDDs SAS (8* HDDs SAS) (2) DVD-ROMs (3) x8 PCI-E (1) x16 PCI-E (1) PCI 32 3.3V (1) 460 watts power supply (750W power supply)	

Power Cords (13 Cord Sets)	
Country	Power Cord Part Number
APD	100614-009, 100613-008, 139867-005, 397138-002 (India)
Brazil	285052-001
Australia/New Zealand	100661-001
Euro	100614-009
France	100614-009
Germany	100614-009
Japan	139867-005
PRC	286496-001, 100613-008, 393312-001
Brazil	438723-001
UK/Singapore	100613-008
US, Taiwan	121565-001

System Unit	**Dimensions** (WxHxD)	7.87 x 16.81 x 24.13 in (200 x 427 x 613 mm) (W/O foot stand)	
	Weight (approximate)	Maximum: (All hard drives, power supplies and processors installed)	30 kg
		Minimum: (One hard drive, power supply and processor installed)	16kg
	Input Requirements (per power supply)	Range Input Voltage	90 to 135 VAC 180 to 265 VAC
		Normal Line Voltage	100 to 127 VAC 200 to 240 VAC
		Rated Input Current	load 10A at 100 to 127 VAC 5A at 200 to 240 VAC
		Rated Input Frequency	47 to 66 Hz
		Rated Input Power (optional 750W RPS)	760 W Max (940W) Max
	BTU Rating	Maximum (optional 750W RPS)	1814 BTU (2243) BTU
	Power Specifications	To review typical power ratings use the Power Advisor which is available via the online tool located at URL: www.hp.com/go/proliant-energy-efficient	
	Power Supply Output Power (per power supply)	Rated Steady-State Power	460W (750W) at 100 VAC for system 460W (750W) at 200 VAC
		Maximum Peak Power	460W (750W) at 100 VAC 460W (750W) at 200 VAC
	System Inlet Temperature	Operating	50° to 95° F (10° to 35° C) at sea level with an altitude derating of 1.8°F per 1,000 ft (1.0° C per every 305 m) above seal level to a maximum of 10,000 ft (3050 m) no direct sustained sunlight . Maximum rate of change is 18°F/hr (10°C/hr). The upper limit may be limited by the type and number of options installed. System performance may be reduced if operating with a fan fault or above 86°F (30°C).
		Non-Operating	-40° to 140° F (-30° to 60° C)
	Relative Humidity (non-condensing)	Operating	10% to 90% relative humidity (Rh), 82.4°F (28°C) maximum wet bulb temperature, non-condensing.
		Non-operating**	10% to 95% relative humidity (Rh), 101.7°F (38.7°C) maximum wet bulb temperature, non-condensing.
	Altitude	Operating	10,000 ft (3000m). Maximum allowable altitude change rate is 1°C per 300m.
		Non-Operating	30,000 ft (9144m). Maximum allowable altitude change rate is 1°C per 300m.
	Acoustic Noise	Listed are the declared A-Weighted sound power levels (LWad) and declared	

	average bystander position A-Weighted sound pressure levels (LpAm) when the product is operating in a 23°C ambient environment. Noise emissions were measured in accordance with ISO 7779 (ECMA 74) and declared in accordance with ISO 9296 9ECMA 109).	
	Idle (Fixed Disk Drives Spinning)	
	L WAd (BELS)	460W non-redundant: 5.4 B 460W redundant: 5.5 B 750W non-redundant: 5.6 B 750W redundant: 5.5 B
	L-pAm	460W non-redundant: 36.8 dBA 460W redundant: 37.4 dBA 750W non-redundant: 36.5 dBA 750W redundant: 36.2 dBA
	Operating (Random Seeks to Fixed Disks)	
	L WAd (BELS)	460W non-redundant: 5.5 B 460W redundant: 5.6 B 750W non-redundant: 6.0 B 750W redundant: 5.7 B
	L-pAM	460W non-redundant: 37.4 dBA 460W redundant: 37.1 dBA 750W non-redundant: 40.6 dBA 750W redundant: 39.1 dBA
Emissions Classification (EMC)	FCC Rating	Class B
	Normative Standards	CISPR 22; EN55022; EN55024; 47 CFR, FCC Rules and Regulations Part 15 Subpart B;VCCI Class B ITE; ICES-003; CNS13438; GB9254; K22;K24; EN 61000-3-2; EN 61000-3-3.

NOTE: Product conformance to cited product specifications is based on sample (type) testing, evaluation, or assessment. This product or family of products is eligible to bear the appropriate compliance logos and statements.

Technical Specifications

HP Half-Height SATA DVD-ROM Optical Drive	Disk	Applicable Disk	CD-ROM, CD-XA, CD-DA (Mode 1, Mode 2, Form 1 and 2) Photo CD (Single and Multi-session) Mixed Mode (Audio and Data combined) CD-R, CD-RW, DVD-ROM, DVD+R, DVD+RW
		Capacity	4.7 GB (DVD-5) 8.54 GB (DVD-9)
	Block Size	DVD Media	2,048 bytes
	Interface	SATA	1.56Gb/s
	Access Times (typical)	Random	<140 ms
		Full-Stroke	<250 ms
	Data Transfer Rate	Sustained	8100 to 21600 KB/s (6X to 16X)
	Cache Buffer	128 KB	
	Start-up Time (typical)	< 7 seconds	
	Stop Time	< 4 seconds	
	Laser Parameters	Type	Semiconductor Laser GaA1As
		Wave Length	780 ± 25 nm
	Operating Conditions	Temperature	41° to 113° F (5° to 45° C)
		Humidity	10% to 90%
	Dimensions	(HxWxD, maximum)	1.7 x 5.85 x 8.11 in (4.49 x 15.0 x 20.3 cm)
		Weight	2.64 lb (1.2 kg)

Smart Array P410 Controller	Dimensions (not including bracket)	Low Profile PCIe Form Factor 19.05 cm x 24.13 cm x 5.72cm (7.5 in x 9.5 in x 2.25 in)
	Disk Drive and Enclosure Interface	3G SAS (Serial Attached SCSI) 1.5G SATA (Serial ATA)
	SAS Connectors	x8 3G SAS provides 2.4GB/s maximum bandwidth
	Cache Memory Speed	DDR2-533MHz with 40 or 72-bit wide bus provides up to 4.2 GB/s maximum bandwidth.
	Server Interface	x8 2.5G PCIe 2.0 provides 2GB/s maximum bandwidth
	SAS Speed	x8 3G SAS provides 2.4GB/s maximum bandwidth
	Logical Drives Supported	Up to 32 logical drives
	Host Memory Addressing	64-bit, supporting greater than 4GB server memory space
	RAID Support	RAID 6, 6+0 (Advanced Data Guarding) NOTE: The minimum of 256 MB cache, battery kit, and Smart Array Advanced Pack License Key upgrade is required to enable RAID 6, 6+0 RAID 5, 5+0 (Distributed Data Guarding) NOTE: The 256MB upgrade is required to enable RAID 5 support on the Smart Array P410i. RAID 5+0 is available with the addition of the optional Battery kit upgrade RAID 1+0 (Striping & Mirroring) RAID 0 (Striping)

Technical Specifications

Embedded HP NC107i PCI Express Gigabit Server Adapter (Embedded)	Network Interface	Integrated 10/100/1000BASE-T Transceiver Combines a triple-speed IEEE 802.3TM - Compliant Media Access Controller (MAC) with a triple-speed Ethernet transceiver.
	Data Transfer Method	Compliant to x1 PCIe Specification
	Controller	BCM5723
	Network Transfer Rate	10Base-T (Half-Duplex) 10 Mb/s 10Base-T (Full-Duplex) 20 Mb/s 100Base-TX (Half-Duplex) 100 Mb/s 100Base-TX (Full-Duplex) 200 Mb/s 1000Base-TX (Half and Full-Duplex) 2000Mb/s
	Connector	RJ-45 connector
	Cable Support	Performs all the physical layer functions for 10BASE-T, 100BASE-T, and 1000BASE-T Ethernet on standard Category 5 UTP
HP Smart Array B110i SATA RAID Controller (RAID 0,1,10)	Dimensions	N/A (embedded) ships standard
	Disk Drive and Enclosure Protocol Support	3.0 Gbps SATA
	Architecture	64-bit
	SAS Connectors	4 internal x1 SATA connectors
	Software Upgradeable Firmware	Yes
	Maximum Capacity	2TB
	Memory Addressing	6GB (maximum)
	Logical Drives Supported	2 (maximum)
	RAID Support	RAID 1 (Mirroring) RAID 0 (Striping) RAID 10
Environment-friendly Products and Approach	End-of-life Management and Recycling	Hewlett-Packard offers end-of-life HP product return, trade-in, and recycling programs in many geographic areas. For trade-in information, please go to: http://www.hp.com/go/green. To recycle your product, please go to: http://www.hp.com/go/green or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner. The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: http://www.hp.com/go/green. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.

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For hard drives, 1GB = 1 billion bytes. Actual formatted capacity is less.